

## THAT WHICH IS CLAIMED IS:

1. A method for treating chronic obstructive pulmonary disease in a subject in need of such treatment, comprising administering an osmotically active compound to an airway surface of the subject in an amount effective to increase the volume of liquid on the airway surface.

2. A method according to Claim 1, wherein the osmotically active compound is an ionic osmolyte.

3. A method according to Claim 2, wherein the ionic osmolyte is a salt.

4. A method according to Claim 1, wherein the osmotically active compound is a non-ionic osmolyte.

5. A method according to Claim 4, wherein the non-ionic osmolyte is a sugar.

6. A method according to Claim 4, wherein the non-ionic osmolyte is a sugar alcohol.

7. A method according to Claim 4, wherein the non-ionic osmolyte is an organic osmolyte.

8. A method according to Claim 3, wherein the salt is selected from the group consisting of choline chloride, choline iodide, lithium chloride, meglumine chloride, L-lysine chloride, D-lysine chloride, ammonium chloride, potassium sulfate, potassium nitrate, potassium gluconate, potassium iodide, ferric chloride, ferrous chloride, and potassium bromide.

9. A method according to Claim 4, wherein the non-ionic osmolyte is selected from the group consisting of glycerol, dihydroxyacetone erythrose, threose, and erythulose, ribose, arabinose, xylose, lyxose, psicose, fructose,

sorbose, and tagatose, altose, allose, glucose, mannose, gulose, idose, galactose, and talose, allo-heptulose, allo-hepulose, gluco-heptulose, manno-heptulose, gulo-heptulose, ido-heptulose, galacto-heptulose, and talo-heptulose.

10. A method according to Claim 7, wherein the organic osmolyte is a polyol compound.

11. A method according to Claim 7, wherein the organic osmolyte is a methylamine compound.

12. A method according to Claim 7, wherein the organic osmolyte is an amino acid.

13. A method according to Claim 7, wherein said organic osmolyte is selected from the group consisting of betaine, taurine, inositol, myoinositol, glycerophosphorylcholine, and tihulose.

14. A method according to Claim 1, further comprising the step of administering a bronchodilator to said subject prior to or concurrently with said osmotically active compound in an amount sufficient to inhibit bronchoconstriction.

15. A method according to Claim 1, wherein the subject is afflicted with cystic fibrosis.

16. A method according to Claim 1, wherein the subject is afflicted with chronic bronchitis.

17. A method according to Claim 1, wherein said subject is afflicted with primary or secondary ciliary dyskinesia.

18. A method according to Claim 1, wherein said subject is afflicted with pneumonia.

19. A method according to Claim 1, wherein said subject is afflicted with sinusitis.

20. A method according to Claim 1, wherein said administering step is an aerosol inhalation administering step.

21. A method according to Claim 1, wherein said administering step is carried out by transbronchoscopic lavage.

22. A method of administering an active therapeutic agent to an airway surface of a subject in need thereof, comprising administering the active agent in an effective therapeutic amount in a vehicle, which vehicle comprises an osmotically active compound, the osmotically active compound included in an amount effective to increase the volume of liquid on the airway surface.

23. A method according to Claim 22, wherein the active agent is selected from the group consisting of antibiotics, antiviral agents, bronchodilators, ion-transport modulators, enzymes, expectorants, viral gene transfer vectors, anti-inflammatory agents, hormones, antihistamines, anti-neoplastic agents, and anti-*Pneumocystis pneumonia* agents.

24. A method according to Claim 23, wherein the active agent is a sodium channel blocker.

25. A method according to Claim 23, wherein the active agent is a P2Y<sub>2</sub> receptor agonist.

26. A method according to Claim 23, wherein the active agent is DNase.

27. A method according to Claim 23, wherein the active agent is a steroid.

28. A method according to Claim 23, wherein the active agent is pentamidine.

29. A method according to Claim 23, wherein the active agent is tobramycin.

30. A method for the lavage of a lung of a patient in need thereof, comprising administering a liquid containing an osmotically active compound to an afflicted portion of the lung of the patient in an amount effective to wash the afflicted lung portion, the osmotically active compound contained in the solution in  
5 an amount effective to increase the volume of water on the airway surface of the portion of the lung to which the liquid is administered.